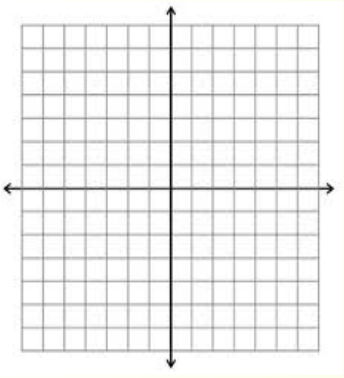
Alg. 2 Warm Up #12-1

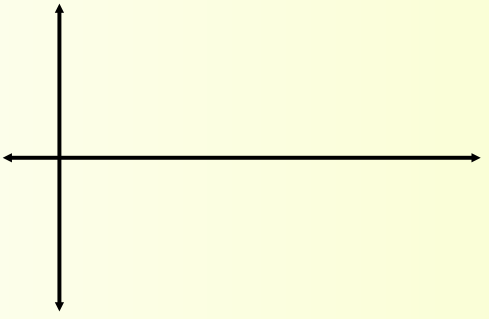
Graph (no grapher):

1. $y = \log_2 x + 2$

x | y



2. $y = 3 \sin 2x + 1$



HW Questions:

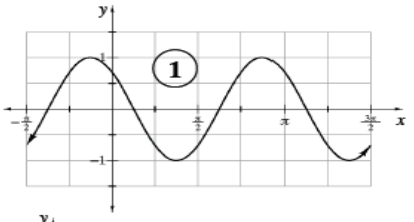
8-91. Use the pattern from the previous problem to help you to evaluate the following expressions.

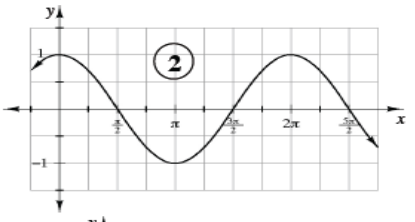
a. i^{592} b. i^{797} c. $i^{10,648,202}$

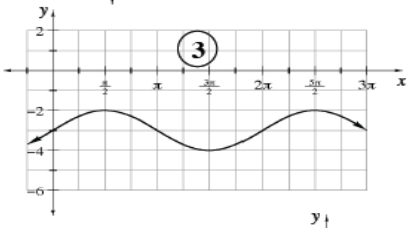
8-94. Match each equation with the appropriate graph. Do this without using a graphing calculator.

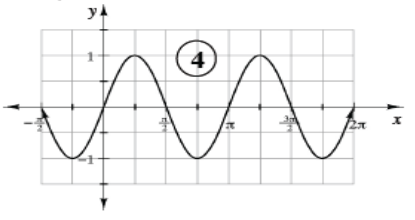
a. $y = \sin(x + \frac{\pi}{2})$ b. $y = \sin(2x)$ c. $y = 2\sin(\frac{x}{2})$

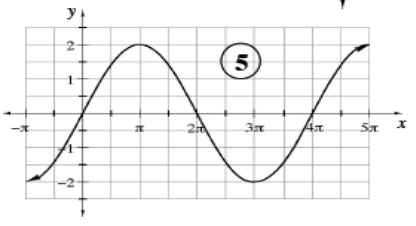
d. $y = \sin(x) - 3$ e. $y = -\sin[2(x - \frac{\pi}{8})]$











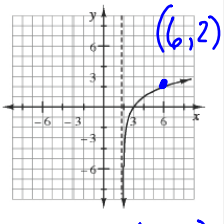
8-95. The La Quebrada Cliff Divers perform shows for the public by jumping into the sea off the cliffs at Acapulco, Mexico. The height (in feet) of a diver at a certain time (in seconds) is given by $h = -16t^2 + 16t + 400$.

a. Use the vertex and y-intercept to make a sketch that represents the dive. What form of the quadratic function helps you determine the y-intercept efficiently? What form helps you determine the vertex easily?

b. At what height did the diver start his jump? What is the maximum height he achieved?

$y = \log_a x$

8-96. Consider the graph at right.



a. What is the parent for this function?

b. What is the equation of the vertical asymptote? $x = 2$

c. Write a possible equation for this graph.

$y = \log_a(x-2)$

$2 = \log_a(6-2)$

$2 = \log_a 4$

$a^2 = 4$

$a = 2$

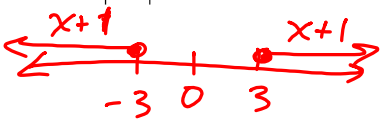
$y = \log_2(x-2)$

HW Questions:

8-127. This problem is a checkpoint for solving and graphing inequalities. It will be referred to as Checkpoint 8A.

Graph the inequality in part (a) and the system of inequalities in part (b).

a. $|x+1| \geq 3$



$x+1 \leq -3$ or $x+1 \geq 3$

$x \leq -4$ or $x \geq 2$

b. $y \leq -2x+3$
$y \geq x$
$x \geq -1$

8-128. Given the equation: $3x+y-z=6$.

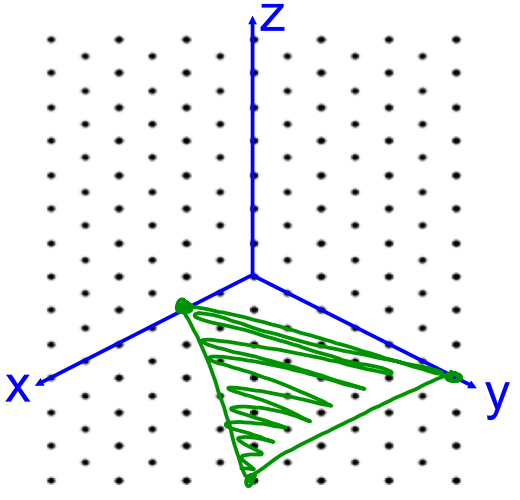
a. Draw a graph.

b. Is $(1, 2, -1)$ on the graph? Justify your answer.

$3(1)+2-(-1) \stackrel{?}{=} 6$

$3+2+1=6$

$6=6$ ✓



8-142. Find the inverse of $g(x) = (x+1)^2 - 3$ with the domain $x \geq -1$. Sketch both graphs and state the domain and range of the inverse function.

8-144. Solve the system of equations at right for (x, y, z).

$x = y + z$

$2x + 3y + z = 17$

$z + 2y = 7$

8-145. Solve $\left(\sqrt{x^2+6}\right)^2 = (x+2)^2$.

$x^2+6 = x^2+4x+4$

$6 = 4x+4$

$2 = 4x$

$x = \frac{1}{2}$

$\sqrt{\left(\frac{1}{2}\right)^2+6} \stackrel{?}{=} \frac{1}{2}+2$

$\sqrt{\frac{1}{4}+\frac{24}{4}} = \frac{1}{2}+\frac{4}{2}$

$\sqrt{\frac{25}{4}}$

$\frac{5}{2} = \frac{5}{2}$ ✓

① $x - y - z = 0$

② $2x + 3y + z = 17$

③ $2y + z = 7$

elim. x

$-2$① + ② → $-2x + 2y + 2z = 0$

$2x + 3y + z = 17$

$5y + 3z = 17$

$-3$③ $-6y - 3z = -21$

$-y = -4$

$y = 4$

$5(4) + 3z = 17$

$3z = -3$

$z = -1$

① $x = 4 - 1$

$x = 3$

$(3, 4, -1)$

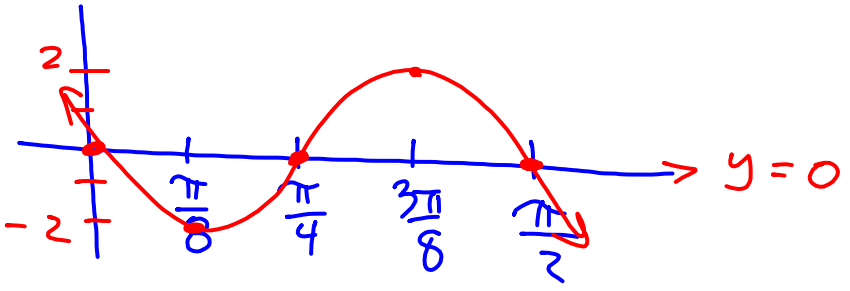
8-146. Sketch the graph of each equation below.

a. $y = 3\sin\left(x + \frac{\pi}{2}\right)$

b. $y = -2\sin(4x)$

$b=4$, 4 cycles in 2π so the per $= \frac{2\pi}{4}$, per $= \frac{\pi}{2}$

Amp = 2
reflect

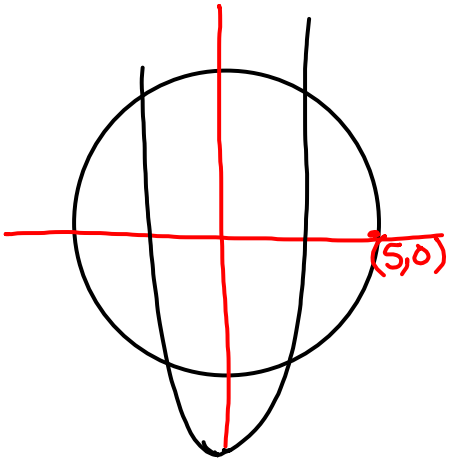


8-151. Sketch both the circle $x^2 + y^2 = 25$ and the parabola $y = x^2 - 13$.

a. How many points of intersection are there?

b. Find the coordinates of these points algebraically.

$x^2 = y + 13$ → sub into other eq.



$y + 13 + y^2 = 25$

$y^2 + y - 12 = 0$

$(y+4)(y-3) = 0$

$y = -4, 3$

$(\ ,-4)$ $(\ ,3)$

8-152. Solve each equation. Be sure to check your answers.

a. $\sqrt{x}+2=x$

$(\sqrt{x})^2=(x-2)^2$

$x=x^2-4x+4$

$0=$

b. $(\sqrt{x}+2)^2=(\sqrt{x+6})^2$

$(\sqrt{x}+2)(\sqrt{x}+2)=x+6$

$x+2\sqrt{x}+2\sqrt{x}+4=x+6$

$-x \quad -4 \quad -x \quad -4$

$\frac{4\sqrt{x}}{4}=\frac{2}{4}$

$(\sqrt{x})^2=(\frac{1}{2})^2$

$x=\frac{1}{4}$

$(a-b)^2=a^2-2ab+b^2$

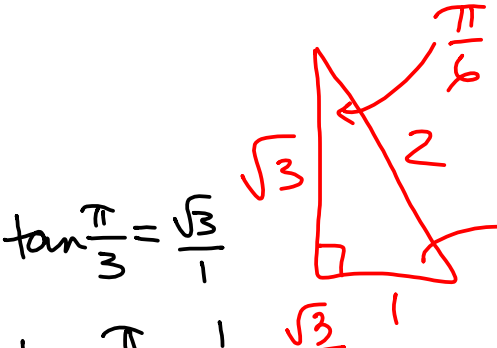
8-155. For each equation, find two solutions $0 \le x < 2\pi$, which make the equation true. No calculator should be necessary.

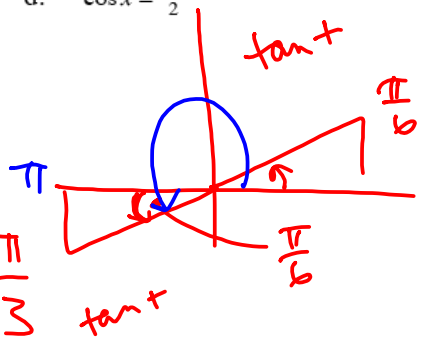
a. $\cos x=-\frac{1}{2}$

b. $\tan x=\frac{\sqrt{3}}{3}=\frac{\pi}{6}, \frac{7\pi}{6}$

c. $\sin x=0$

d. $\cos x=\frac{\sqrt{2}}{2}$





$\tan\frac{\pi}{3}=\frac{\sqrt{3}}{1}$

$\tan\frac{\pi}{6}=\frac{1}{\sqrt{3}}\cdot\frac{\sqrt{3}}{\sqrt{3}}$

$\frac{\sqrt{3}}{3}$

8-158. Solve each equation.

a. $\log_3(2x-1) = -2$

$3^{-2} = 2x - 1$

$\frac{1}{9} = 2x - 1$

b. $5^{\log_5(x)} = 3$

c. $\log_2(x) - \log_2(3) = 4$

$\log_2\left(\frac{x}{3}\right) = 4$

$3 \cdot 2^4 = \frac{x}{3} \cdot 3$

d. $\log_3(5) = x$

$3^x = 5$

$\log 3^x = \log 5$

$x \log 3 = \log 5$

$\frac{x \log 3}{\log 3} = \frac{\log 5}{\log 3}$

$x \approx$

8-161. Solve each equation below for x.

a. $1234x + 23456 = 987654$

b. $\frac{10}{x} + \frac{20}{x} = 5$

c. $5x^2 - 6x + 1 = 0$

d. $x^3 - 3x^2 + 2x = 0$

$x(x^2 - 3x + 2) = 0$

$x(\quad)(\quad) = 0$

8-164. Change each angle from degrees to radians.

a. 60° $\frac{\pi}{3}$ b. 75° $\frac{\pi}{180}$ c. 210° d. 225°

$15 \cdot \frac{\pi}{36}$

$\frac{5\pi}{12}$

Without using a calculator, sketch rough graphs of the following functions.

a. $P(x) = -x(x+1)(x-3)$

b. $P(x) = (x-1)^2(x+2)(x-4)$

c. $P(x) = (x+2)^3(x-4)$

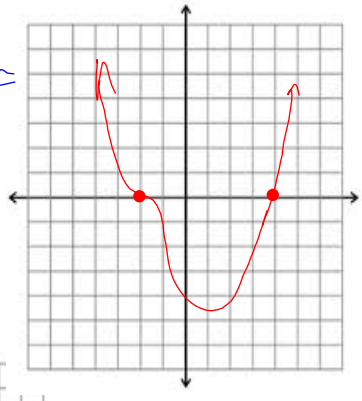
a. $P(x) = -x(x+1)(x-3)$ 3rd

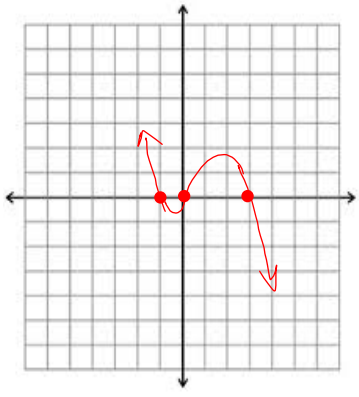
Rt down, left up

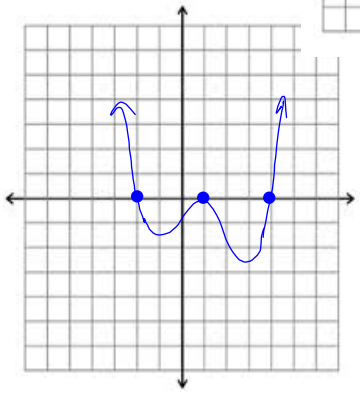
b. $P(x) = (x-1)^2(x+2)(x-4)$ 4th

Rt ↑ left up

c. $P(x) = (x+2)^3(x-4)$ 4th







Practice, expand:

1) $(7 + 4i)^2$

$49 + 56i + 16i^2$

$33 + 56i$

2) $(x - 3)^3$

$1x^3 + 3x^2(-3) + 3x(-3)^2 + 1(-3)^3$

$x^3 - 9x^2 + 27x - 27$

3) $(6 - 5i)^2$

$36 - 60i + 25i^2$

$11 - 60i$

Things to review for the final:

+ - x ÷ Rational Expressions

Absolute Value Inequalities

Inverses, Exponents & Logarithms

3-D Graphing and Solve a System with 3 variables

Trig: Unit circle, special Δ's, pythagorean identity, sine & cosine graphs, transformations

Polynomials:
- Equations <---> Graphs
- imaginary #'s

HW: 8 - # 169, 177, 181, 184,

9 - # 25-28, 42-44, 53, 56, 58, 69, 77, 79

Alg. 2 Warm Up #12-1

1. Solve on $(0, 2\pi]$

$\cos x - \cos x(\sin x) = 0$

2. Solve on $[\pi, 2\pi]$

$6\cos x = 3$

Alg. 2 Warm Up #12-1

Solve on $(0, 2\pi]$

1. $2 - 2\cos^2 x = \sin x + 1$

2. $\cos x (\tan x) = 0.64$

3. $4 \sin\theta \cos\theta = \dfrac{3}{\tan\theta}$